

Profiles in Cardiology

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Karl Rokitanski

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The son of a Czech county officer and an Irish mother, Karl Rokitanski was born February 19, 1804, in Hradec Králové, the cultural center of eastern Bohemia. He was matriculated at the medical faculty of Prague's Charles University at the age of 18. Two years later he left Prague and continued his studies at the medical faculty of Vienna University. In 1827, a year before receiving his M.D. degree, he started work in the dissection lab of the Vienna General Hospital as an unpaid volunteer, and three years later became a paid assistant dissector. In 1832, he was nominated associate professor and custodian of the Museum of Pathology at the medical faculty of Vienna University, and two years later was nominated Chair of Pathology—the first at Vienna University.¹

Apart from his monumental work in pathology, Rokitanski gave considerable attention to promoting modern teaching at the university. He was elected Dean of the Medical School of Vienna University for four terms (1849–1850, 1856–1857, 1859–1860, 1862–1863) and even became the first freely elected rector of Vienna University during 1852 and 1853. A member of the Academy of Sciences in Vienna since 1848 and elected its President in 1869, Rokitanski led the Academy until his death on July 23, 1878. Beginning in 1863, he worked as a medical referee in the Ministry of Culture and Education and became a member of the Upper Chamber of the Austro-Hungarian Imperial Council in 1874. In the same year, he was raised to nobility by having a baronetcy conferred upon him.

Stimulated by French and English medical literature, Rokitanski's basic principle of work, from the beginning of his involvement in pathology, was "conclusion based on obser-

vation," in contrast to the then prevailing German "Naturphilosophie" speculation. An advantage of this intelligent autodidact was the unique situation in Vienna. With only one dissection laboratory and approximately 2,000 autopsies performed a year, Rokitanski learned how to systematize and classify organ lesions from macroscopic observations and identified a great number of diseases. In close cooperation with his clinical colleagues and friends (in internal medicine with Josef Skoda in particular) confrontation with the clinical diagnosis—apart from diagnostic advances in other medical specialties such as surgery, gynecology, obstetrics, ophthalmology, and dermatology—substantially promoted diagnosis of diseases at bedside.

Within a decade, Rokitanski published his fundamental work, *Handbook of Pathological Anatomy*. Volume 2 in 1842 and Volume 3 in 1844 covered descriptions of diseased organs. This handbook is the foundation of pathology as a separate discipline and appeared to instant high acclaim. In fact, pathologic anatomy became the most fundamental part of medicine. Rokitanski became the main star in the so-called second medical school of Vienna, which attracted students and postgraduates from all of Europe as well as from overseas. In 1885, Virchow considered his classification of diseases to be of similar importance for pathology as that of Linné for botany. Chairs of pathology in most universities of the Austro-Hungarian empire were filled by his pupils.

The fate of the first volume on general pathology, published in 1848, was different. As a great number of deaths occurred without macroscopically visible organ lesions, and as it was not possible to localize the disease in specific organs, Rokitanski put forth a hypothesis called "Krasen Lehre"—humoral pathology—with the site of the disease state being somewhere in the blood fluid embracing all organs. The idea was formulated before organic chemistry and biochemistry came into being. Young Rudolph Virchow, then 27, recognized the fallacy of attempts to explain morphology by means of a not yet developed chemistry and took a strong line over the humoral hypothesis. Within a short time, the giant Rokitanski understood, and the second edition of the handbook came out in 1855 without the theory of humoral pathology.²

Looking at the problem a hundred years later, it appears that Rokitanski's idea was too advanced to be understood. In

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FIG. 1 Dissection laboratory at Vienna General Hospital. (Source: Ref. No. 2). Reproduced by permission of the Institute for the History of Medicine, University of Vienna.

the thrombotic theory of atherogenesis proposed by Duguid and Astrup, the latter's description is very clear:

Rokitanski suggested that fibrinous deposits were produced on the vessel wall by an effect of the exudate released from injured tissue on some components in the blood. This concept was one of the main reasons for Virchow's rejection of Rokitanski's idea, since he thought blood clotting was caused by oxygen. Intuitively, Rokitanski reached views concerning physiological processes which forecast observations made many years later. His concepts were developed before fibrinogen was known as an entity, before thrombin was known, before the clot promoting effect of the tissue ex-

tract was known and more than sixty years before its role as an activator and its difference from thrombin was revealed by Morawitz and Fuld and Spiro.

Rokitanski's swan song was the monograph *The Defects of the Heart Septum*. In this monograph of 56 pages, lavishly illustrated and dedicated to the Society of Physicians in Vienna, the author describes his personal observations of 24 patients with ventricular septal defects and 20 with atrial septal defects. A detailed characterization of various forms of defects is followed by the description of the evolution of chicken embryos (experiments by Lindes) and of the origin of heart malformations, including the various forms of the transposition of the great vessels.⁴



FIG. 2 Collegium of professors at Vienna University. Karl von Rokitanski (1804–1878) is seated in the middle holding a book. On his right is Joseph Skoda. Source: Ref. No. 2. Reproduced by permission of the Institute for the History of Medicine, University of Vienna.

Beginning with his early days as dissector, Rokitanski, by his new approach to pathology as well as by his approach to teaching and research at the University of Vienna, brought fresh air to progress and liberalization. He was the leading spirit in the struggle to overcome the traditional approach of the first Vienna medical school and, as head of young students, he brought new life into the university. In the second half of the century Vienna again became the center of medicine in Europe, and the pathologist Rokitanski, with the internist Joseph Skoda, were the two most important personalities in attracting students from all over Europe to visit and study in Vienna.

As the first pathologist on our planet, Karl Rokitanski has a place among the most outstanding personalities of medicine in the world, first of all because of his unbelievable performance. His published work is based on personal knowledge of more than 60,000 autopsies performed in his Institute and more than 25,000 forensic autopsies. In addition, he held several important appointments at Vienna University, at the Ministry of Culture and Education, as well as at the Academy of Sciences. Rokitanski's successor, Prof. R. Herschel (1824–1881) compared his contribution to

medicine with that of Copernicus to astronomy. It seems that he did not exaggerate.

Karl Rokitanski's particular contribution to cardiology is the idea of the thrombus formation in the wall of the artery as the beginning of atherogenesis, based on the findings of fibrous deposits in the pulmonary artery; and, of course, the detailed description and classification of atrial and ventricular septal defects.

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